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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/555,710	08/11/2006	Kazushige Yonenaga	5259-000060/US/NP	9721
27572	7590	04/01/2009	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C.			LIU, LI	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/555,710	Applicant(s) YONENAGA ET AL.	
	Examiner LI LIU	Art Unit 2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-43 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. This application contains claims directed to the following patentably distinct species:

Species 1, Figures 2 and 3 (the clock extraction circuit is used to extract the clock from the signal train output from the balanced photodetector; power detection circuit detects the power of the clock signal output from the clock extraction circuit, and extracts the low-frequency signal with frequency f_1 superposed on the clock signal).

Species 2, Figure 4 (the optical transmitter has a clock signal generation circuit and an intensity modulator; the optical receiver is provided with an optical splitting circuit which splits one of the ports among the two output ports of the Mach-Zehnder Interferometer, a monitoring photodetector is connected to the optical splitting circuit).

Species 3, Figure 5 (a differential circuit is used to detect the correlation, that is, the difference between, the output signal of the data regeneration circuit and the signal before data discrimination).

Species 4, Figures 6, 7 and 8 (an oscillation circuit which generates a signal at a frequency f_2 sufficiently high to enable superpositioning of the low-frequency signal at frequency f_1 , an intensity modulation unit performs either directly intensity-modulation of the light source at the transmitter or performs intensity-modulation of the signal light at the receiver using the oscillation frequency f_2 , and an amplifier and a filter extract the component at frequency f_2 from the intensity-modulated light output from a monitoring photodetector).

Species 5, Figure 9 (the optical receiver has an input level adjustment unit, which renders asymmetrical the input levels of converted intensity-modulated light for input to the balanced photodetector; an extraction circuit which extracts the component at the frequency f_2 from an output signal of the balanced detection circuit).

Species 6, Figure 13 (an eye-opening monitoring circuit monitors the opening of the eye pattern of the main signal output from the balanced detection circuit, and a band-pass filter passes the infinitesimal-modulated signal component (f_1)).

Species 7, Figure 14 (a data regeneration circuit discriminates and regenerates data and provides code error detection functions, an error count monitoring circuit monitors the number of errors).

Species 8, Figure 15 (an equalizing amplification circuit consists of a transimpedance amplifier (TIA) and a limiting amplifier (LIM), and a data regeneration circuit discriminates and regenerates data from the output of the equivalent amplification circuit, a current consumption monitoring circuit monitors the current consumption of the equivalent amplification circuit; the current consumption differs depending on the amplitude of the input signal to the transistor amplification circuit).

Species 9, Figure 16 (the balanced detection circuit has two optical splitting circuits provided on each of the two output arms of the Mach-Zehnder interferometer; an optical coupling circuit couples the two optical signals split by the splitting circuits; a photodetector detects light coupled by the optical coupling circuit; the light in the two optical paths which are split and then recoupled have equal bit lengths but are opposite in optical phase. The power fluctuation is detected by the photodetector).

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Species 10, Figures 17 and 21 (amplification circuits detect the optical current flowing in photodetectors of the balanced photodetector and amplifies the current, and a resistor applies a bias voltage to the balanced photodetector; and the FSR (free spectral range) of the Mach-Zehnder interferometer is set to be larger than the main signal clock rate).

Species 11, Figure 23 (an MZI warm-up detection circuit detects the warmed-up state based on the temperature of the Mach-Zehnder interferometer; a loop open/close switch opens/closes the control loop which performs feedback control to the Mach-Zehnder interferometer; a lock detection circuit, upon detecting the locked state of the control loop based on the error signal from the synchronous detection circuit, outputs a lock detection signal, and a control circuit with loop re-locking function has a function for re-locking when the control loop deviates from a lock on the optical frequency).

Species 12, Figures 28-30 (the Mach-Zehnder interferometer has two phase adjustment terminals on each of its two arms, an infinitesimal-modulated signal is applied to one arm, while a feedback control signal is applied to another arm; no adder; and an infinitesimal-modulation operating point setting circuit compares the reference voltage V_{ref2} and the output of the infinitesimal-modulated signal oscillation circuit and outputs a signal to set an infinitesimal-modulated signal operating point; and an MZI offset setting circuit compares the reference voltage V_{ref3} and the output of the synchronous detection circuit and outputs a signal to determine the feedback control signal operating point; and the optical receiver can have a control signal communication

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circuit which exchanges control signals with the optical transmitter using the control line).

2. The species are independent or distinct because claims to the different species recite the mutually exclusive characteristics of such species. In addition, these species are not obvious variants of each other based on the current record.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claims 1 and 23-25 are generic.

There is an examination and search burden for these patentably distinct species due to their mutually exclusive characteristics. The species require a different field of search (e.g., searching different classes/subclasses or electronic resources, or employing different search queries); and/or the prior art applicable to one species would not likely be applicable to another species; and/or the species are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species to be examined even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected species**, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

The election of the species may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly

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and specifically point out supposed errors in the election of species requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected species.

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the species unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other species.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

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4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LI LIU whose telephone number is (571)270-1084. The examiner can normally be reached on Monday-Friday, 8:30 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Li Liu/
Examiner, Art Unit 2613
March 28, 2009